

# Hazard map Solotvyno

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## History

Version	Date	Modification reason	Modified by
0.1		Initial draft	
0.9		Quality check	
1.0		Final reviewed deliverable	



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## List of abbreviations

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<Abbreviation>	<Explanation>
Project Name	Lorem Ipsum



## Executive summary

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## Introduction

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In this deliverable the zoning of hazards is mapped.





## 1 Methodology

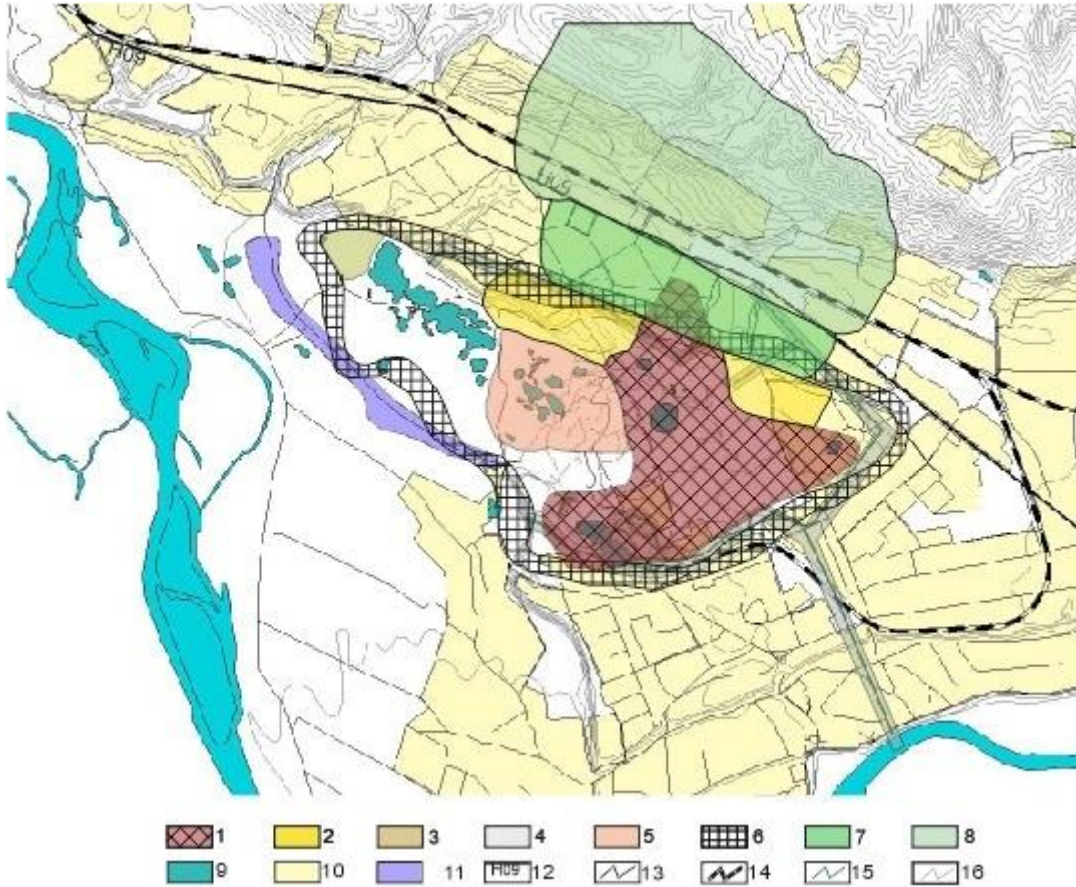
The zoning and the hazards are large derived from the EUCPT Advisory mission to Soltvyno in 2016. In the report of this mission several mechanisms are described. Also the scientist of the IGS have gained additional insight in the possible karstification along the flanks of the salt dome.

In section 2 the zoning of the terrain is presented. In section 3 The qualitative hazards are given.



## 2 Zoning the terrain on and around the mining area

### 2.1 MAP 1: zoning topographic layer

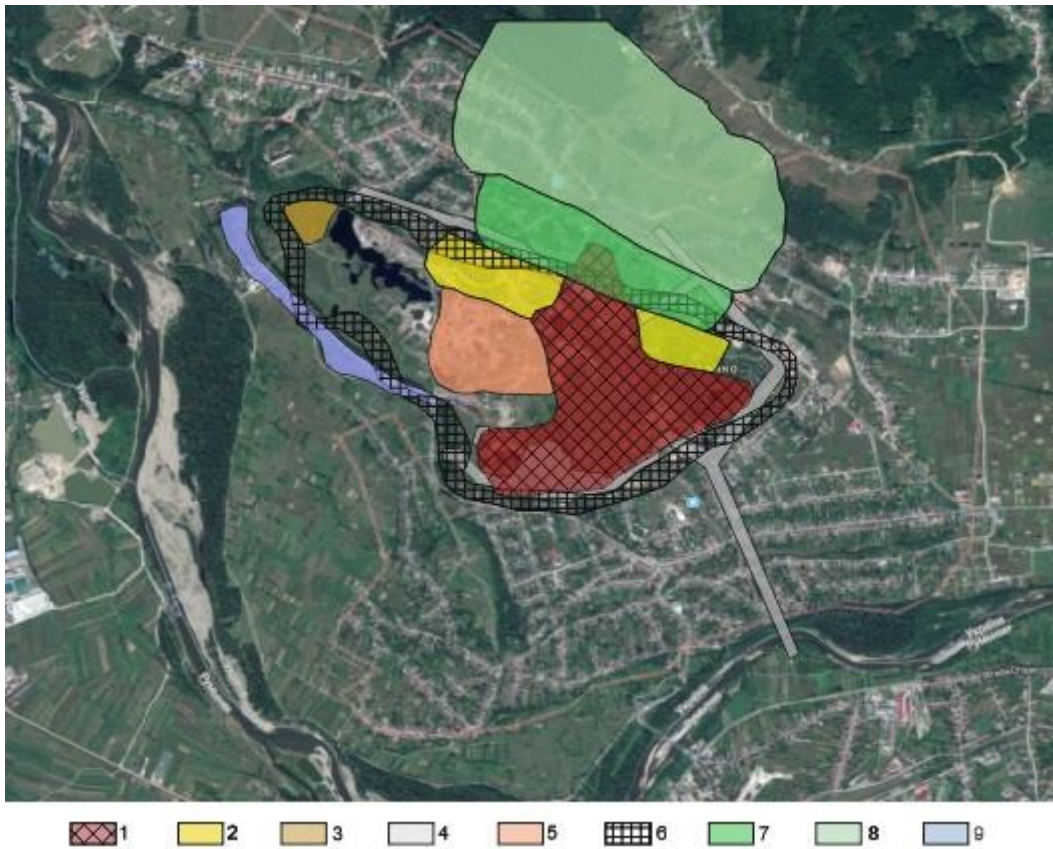


#### Legend

1 – Zone 1 (mines #7, #8, #9, Old Ludvig, Black Moore, sinkholes areas); 2 – Zone 2 (mine #9 flanks); 3 – Zone 3 (underground caverns / abandoned fuel storage); 4 – Zone 4 (areas of drainage systems influence); 5 – Zone 5 (old mines Kunigunda-Nikolay, Albert, Joseph and lakes area); 6 – Zone 6 (marginal area of faults around Solotvyn Salt dome structure); 7 - Zone 7 Terrace slope; 8 – Zone 8 (slope of the Magura Mountain); 9 – Tisza River, natural lakes and flooded mines; 10 – Solotvyno area; 11 – dam; 12 – highway H09; 13 – roads; 14 – railway; 15 – drainage systems; 16 – isolines



## 2.2 MAP 2: zoning satellite imagery layer

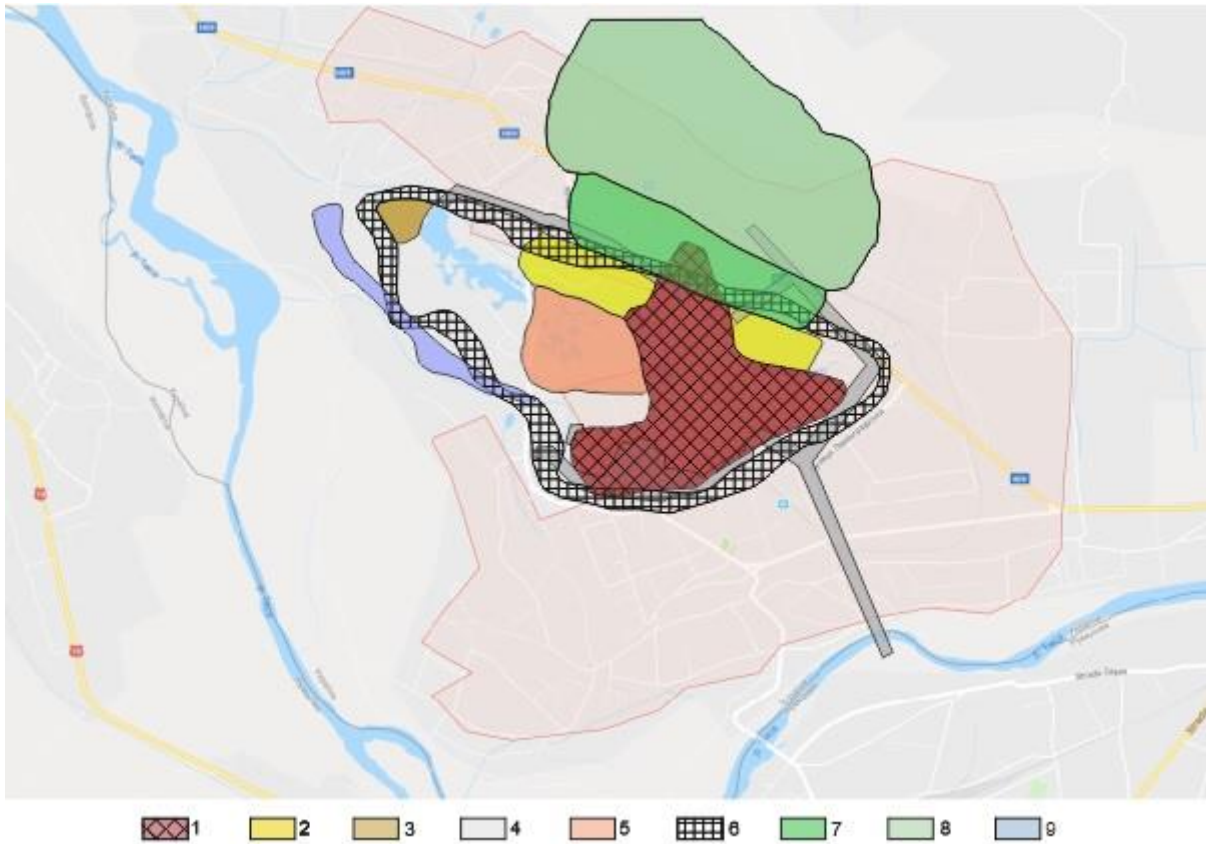


### Legend

1 – Zone 1 (mines #7, #8, #9, Old Ludvig, Black Moore, sinkholes areas); 2 – Zone 2 (mine #9 flanks); 3 – Zone 3 (underground caverns / abandoned fuel storage); 4 – Zone 4 (areas of drainage systems influence); 5 – Zone 5 (old mines Kunigunda-Nikolay, Albert, Joseph and lakes area); 6 – Zone 6 (marginal area of faults around Solotvyn Salt dome structure); 7 - Zone 7 Terrace slope; 8 – Zone 8 (slope of the Magura Mountain); 9 – dam



## 2.3 MAP 3: zoning topographic layer



### Legend

1 – Zone 1 (mines #7, #8, #9, Old Ludvig, Black Moore, sinkholes areas); 2 – Zone 2 (mine #9 flanks); 3 – Zone 3 (underground caverns / abandoned fuel storage); 4 – Zone 4 (areas of drainage systems influence); 5 – Zone 5 (old mines Kunigunda-Nikolay, Albert, Joseph and lakes area); 6 – Zone 6 (marginal area of faults around Solotvyn Salt dome structure); 7 - Zone 7 Terrace slope; 8 – Zone 8 (slope of the Magura Mountain); 9 – dam



### **3 HAZARDS**

#### **3.1 Zone 1 (mines #7, #8, #9, Old Ludvig, Black Moore, sinkholes areas);**

Mayor collapses possible due to large voids made by mining and karstification around major influx opening in flank of Salt Dome (Black Moor)

#### **3.2 Zone 2 (mine #9 flanks);**

Karstification on flanks of salt dome due to fresh water flow

#### **3.3 Zone 3 (underground caverns / abandoned fuel storage);**

Old USSR fuel deposit in Salt dome. Unknown what and where.

#### **3.4 Zone 4 (areas of drainage systems influence);**

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#### **3.5 Zone 5 (old mines Kunigunda–Nikolay, Albert, Joseph and lakes area);**

Unknown if all voids are filled and if karstification is still proceeding

#### **3.6 Zone 6 (marginal area of faults around Solotvyn Salt dome structure);**

The salt dome is rising, due to loss of weight and tectonic forces.

#### **3.7 Zone 7 (Terrace slope);**

Instable fluvial soil, prone to subsidence due to flank karstification

#### **3.8 Zone 8 (slope of the Magura Mountain);**

Old signs of previous landslides visible. Disturbance of surface by roadworks and housing. Subsidence on terrace slope destabilises base of the slope.

#### **3.9 Zone 9 (dam)**

The dam was built in the interbellum to protect the mine from flooding. Possibility that under the dam a freshwater flow is present.



## 4 Conclusions

This first draft of risk map of Solotvyno is the starting point to further exploration. This together with other scientific sources and local knowledge of inhabitants. Both the Maps and the Hazards will be refined during the course of the project.



## 5 References

- [1] EUCPT, Risk Assessment report on the Solotvyno mine and surrounding, November 2016